

C monitoring a driving signal that drives the first switch and the second switch to detect a state that the first switch and the second switch are simultaneously turned on.

### REMARKS

Claims 1-40 are pending in this application. Claims 1, 8, 15, 22, 29, and 36-40 are independent claims. Claims 2-7, 9-14, 16-21, 23-28, and 30-35 are dependent claims.

Claims 1-6, 8-13, 15-20, 22-27, 29-34, and 36-40 have been rejected. The Examiner objected to claims 7, 14, 21, 28, and 35 as being dependent upon a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Amendments to claims 1-40 are presented herein. The features of claims 7, 14, 21, 28, and 35 have been added to independent claims 36-40. Claims 7, 14, 21, 28, and 35 have been rewritten in independent form. Independent claims 1, 8, 15, 22, and 29 have been cancelled. Dependent claims 2-6, 9-13, 16-20, 23-27, and 30-34 have been respectively amended to depend from amended claims 7, 14, 21, 28, and 35. No new matter is being presented, and approval and entry are respectfully requested.

### Entry of Amendment Under 37 C.F.R. §1.116:

Applicants request entry of this Rule 116 Response because:

- (a) rejected claims 1, 8, 15, 22, and 29 have been canceled;
- (b) it is believed that the amendment of claims 2-7, 9-14, 16-21, 23-28, and 30-40 puts this application into condition for allowance as suggested by the Examiner;
- (c) the amendments were not earlier presented because the Applicants believed in good faith that the cited prior art did not disclose the present invention as previously claimed;
- (d) the amendments of claims 2-7, 9-14, 16-21, 23-28, and 30-35 should not entail any further search by the Examiner since no new features are being added or no new issues are being raised; and

(e) the amendments do not significantly alter the scope of the claims and place the application at least into a better form for purposes of appeal.

The Manual of Patent Examining Procedures sets forth in Section 714.12 that "any amendment that would place the case either in condition for allowance or in better form for appeal may be entered." Moreover, Section 714.13 sets forth that "the Proposed Amendment should be given sufficient consideration to determine whether the claims are in condition for allowance and/or whether the issues on appeal are simplified." The Manual of Patent Examining Procedures further articulates that the reason for any non-entry should be explained expressly in the Advisory Action.

### **The Objections to the Drawings**

In item 1 on page 2 of the Office Action, the Examiner objected to Figures 1 and 2 for not including a legend such as --Prior Art--. Applicants provide a proposed drawing correction in red ink for Figures 1 and 2 with this response that adds the legend --Prior Art-- to Figures 1 and 2.

In item 2 on page 2 of the Office Action, the Examiner objected to the drawings as not showing every feature of the claimed invention. Applicants provide a proposed drawing correction in red ink for Figure 2 with this response that amends Figure 2 as suggested by the Examiner on page 5 of the Office Action.

In item 3 on page 2 of the Office Action, the Examiner objected to the drawings as using the same reference character "52" to designate both the charger in Figure 2 and the DC-DC converter in Figures 2 through 4. Applicants provide a proposed drawing correction in red ink for Figure 2 with this response that designates the charger in Figure 2 with reference numeral "51," which corresponds to the description of the charger on page 19, line 17 of the specification.

Accordingly, reconsideration and withdrawal of the outstanding objections to the drawings are respectfully requested. Corrected formal drawings shall be filed upon issuance of a Notice of Allowance.

**Rejections Under 35 U.S.C. § 103(a)**

In items 5 and 6 on page 3 of the Office Action, the Examiner rejected claims 1-6, 8-13, 15-20, 22-27, 29-34, and 36-40 under 35 U.S.C. § 103(a) as being unpatentable over Nguyen (U.S. Patent No. 6,069,471) in combination with Kuriyama et al. (U.S. Patent No. 5,933,341). Applicants respectfully traverse these rejections for the reasons presented below.

In item 7 on page 4 of the Office Action, the Examiner objected to claims 7, 14, 21, 28, and 35 as being dependent upon a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. On page 6 of the Office Action, the Examiner suggested incorporating the recitations of dependent claims 7, 14, 21, 28, and 35 into independent claims 1, 8, 15, 22, 29, and 36-40. The features of claims 7, 14, 21, 28, and 35 have been added to independent claims 36-40. Claims 7, 14, 21, 28, and 35 have been rewritten in independent form, and claims 1, 8, 15, 22, and 29 have been cancelled. Dependent claims 2-6, 9-13, 16-20, 23-27, and 30-34 have been respectively amended to depend from claims 7, 14, 21, 28, and 35.

Therefore, Applicants submit that claims 2-7, 9-14, 16-21, 23-28, and 30-40 patentably distinguish over the prior art. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under § 103.

**CONCLUSION**

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding rejections, the application is submitted to be in condition for allowance, which action is earnestly solicited.

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Serial No. 09/770,238

Docket No. 1080.1090

Finally, if there are any additional fees associated with filing of this Response, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS**

Please **CANCEL** claims 1, 8, 15, 22, and 29.

Please **AMEND** the following claims:

2. (TWICE AMENDED) A switching regulator according to claim [1]Z, wherein the switching regulator further comprises a display unit that displays when the main switch and the synchronous switch are simultaneously turned on.

3. (TWICE AMENDED) A switching regulator according to claim [1]Z, wherein the switching regulator further comprises an operation stop circuit that stops a conversion operation of the switching regulator in a case where the main switch and the synchronous switch are simultaneously turned on.

4. (TWICE AMENDED) A switching regulator according to claim [1]Z, wherein the detection circuit monitors at least one of the main switch and the synchronous switch.

5. (TWICE AMENDED) A switching regulator according to claim [1]Z, wherein the detection circuit monitors a direction of a current conducting through the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

6. (TWICE AMENDED) A switching regulator according to claim [1]Z, wherein the detection circuit monitors a magnitude of a current conducting through the main switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

7. (TWICE AMENDED) A switching regulator [according to claim 1], comprising:  
a main switch;  
a synchronous switch, where the main switch and the synchronous switch are alternately  
turned on so that a voltage of a DC electric power is transformed and output; and

a detection circuit that detects when the main switch and the synchronous switch are simultaneously turned on,

wherein the detection circuit monitors a driving signal that drives the main switch and the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

9. (TWICE AMENDED) A switching regulator according to claim [8]14, wherein the switching regulator further comprises detection result output that outputs a detection result of the detection circuit.

10. (TWICE AMENDED) A switching regulator according to claim [8]14, wherein the switching regulator further comprises an operation stop circuit that stops a conversion operation of the switching regulator in a case where the main switch and the synchronous switch are simultaneously turned on.

11. (TWICE AMENDED) A switching regulator according to claim [8]14, wherein the detection circuit monitors at least one of the main switch and the synchronous switch.

12. (TWICE AMENDED) A switching regulator according to claim [8]14, wherein the detection circuit monitors a direction of a current conducting through the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

13. (TWICE AMENDED) A switching regulator according to claim [8]14, wherein the detection circuit monitors a magnitude of a current conducting through the main switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

14. (TWICE AMENDED) A switching regulator [according to claim 8], comprising:  
a main switch;  
a synchronous switch where the main switch and the synchronous switch are alternately turned on so that a voltage of a DC electric power is transformed and output; and

a switching control circuit that controls the main switch and the synchronous switch, comprising a detection circuit that detects a state that the main switch and the synchronous switch are simultaneously turned on,

wherein the detection circuit monitors a driving signal that drives the main switch and the synchronous switch to detect [a] the state that the main switch and the synchronous switch are simultaneously turned on.

16. (TWICE AMENDED) A monitor circuit according to claim [15]21, wherein the monitor circuit further comprises a detection result output that outputs a detection result of the detection circuit.

17. (TWICE AMENDED) A monitor circuit according to claim [15]21, wherein the monitor circuit further comprises an operation stop circuit that stops a conversion operation of the switching regulator in a case where the main switch and the synchronous switch are simultaneously turned on.

18. (TWICE AMENDED) A monitor circuit according to claim [15]21, wherein the detection circuit monitors at least one of the main switch and the synchronous switch.

19. (TWICE AMENDED) A monitor circuit according to claim [15]21, wherein the detection circuit monitors a direction of a current conducting through the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

20. (TWICE AMENDED) A monitor circuit according to claim [15]21, wherein the detection circuit monitors a magnitude of a current conducting through the main switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

21. (TWICE AMENDED) A monitor circuit [according to claim 15] for a switching regulator, comprising:

a main switch; and

a synchronous switch, both of which are alternately turned on so that a voltage of a DC electric power is transformed and output, the monitor circuit comprising a detection circuit that

detects a state that the main switch and the synchronous rectifying switch are simultaneously turned on,

wherein the detection circuit monitors a driving signal that drives the main switch and the synchronous switch to detect [a] the state that the main switch and the synchronous switch are simultaneously turned on.

23. (TWICE AMENDED) An electronic equipment according to claim [22]28, wherein the electronic equipment further comprises a display unit that displays that the main switch and the synchronous switch are simultaneously turned on.

24. (TWICE AMENDED) An electronic equipment according to claim [22]28, wherein the electronic equipment further comprises an operation stop circuit that stops a conversion operation of the switching regulator in a case where the main switch and the synchronous switch are simultaneously turned on.

25. (TWICE AMENDED) An electronic equipment according to claim [22]28, wherein the detection circuit monitors at least one of the main switch and the synchronous switch.

26. (TWICE AMENDED) An electronic equipment according to claim [22]28, wherein the detection circuit monitors a direction of a current conducting through the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

27. (TWICE AMENDED) An electronic equipment according to claim [22]28, wherein the detection circuit monitors a magnitude of a current conducting through the main switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

28. (TWICE AMENDED) An electronic equipment [according to claim 22], comprising:  
a switching regulator;  
a main switch;  
a synchronous switch, where the main switch and the synchronous switch are alternately turned on so that a voltage of a DC electric power is transformed and output; and



a detection circuit that detects when the main switch and the synchronous switch are simultaneously turned on, wherein the electronic equipment is operative with an electronic power from the switching regulator,

wherein the detection circuit monitors a driving signal that drives the main switch and the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

30. (TWICE AMENDED) A method of monitoring a switching regulator according to claim [29]35, further comprising displaying in accordance with the detecting, that the main switch and the synchronous switch are simultaneously turned on.

31. (TWICE AMENDED) A method of monitoring a switching regulator according to claim [29]35, wherein a conversion operation of the switching regulator is stopped in accordance with the detecting.

32. (TWICE AMENDED) A method of monitoring a switching regulator according to claim [29]35, wherein the detecting monitors at least one of the main switch and the synchronous switch.

33. (TWICE AMENDED) A method of monitoring a switching regulator according to claim [29]35, wherein the detecting monitors a direction of a current conducting through the synchronous switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

34. (TWICE AMENDED) A method of monitoring a switching regulator according to claim [29]35, wherein the detecting monitors a magnitude of a current conducting through the main switch to detect a state that the main switch and the synchronous switch are simultaneously turned on.

35. (TWICE AMENDED) A method of monitoring a switching regulator [according to claim 29], comprising:  
turning on a main switch;

turning on a synchronous switch, wherein the main switch and the synchronous switch are alternately turned on so that a voltage of a DC electric power is transformed and output; and detecting a state that the main switch and the synchronous rectifying switch are simultaneously turned on is detected,

wherein the detecting monitors a driving signal driving the main switch and the synchronous switch to detect [a] the state that the main switch and the synchronous switch are simultaneously turned on.

36. (TWICE AMENDED) A switching regulator, comprising:

a first switch;

an inductor which is connected in series with the first switch;

a second switch disposed between a connecting point of the first switch with the inductor and a ground point, in which the first switch and the second switch are alternately turned on so that a voltage of a DC electric power is transformed and [outputted] output; and

a detection circuit that detects a state that the first switch and the second switch are simultaneously turned on,

wherein the detection circuit monitors a driving signal that drives the first switch and the second switch to detect the state that the first switch and the second switch are simultaneously turned on.

37. (TWICE AMENDED) A switching regulator control circuit, comprising:

a first switch connected in series to an inductor;

a second switch disposed between a connecting point of the first switch with the inductor and a ground point where the first switch and the second switch are alternately turned on so that a voltage of a DC electric power is transformed and [outputted] output; and

a detection circuit that detects when the first switch and the second switch are simultaneously turned on,

wherein the detection circuit monitors a driving signal that drives the first switch and the second switch to detect a state that the first switch and the second switch are simultaneously turned on.

38. (TWICE AMENDED) A monitor circuit for a switching regulator control circuit, comprising:

a first switch connected in series to an inductor;

a second switch disposed between a connecting point of the first switch with the inductor and a ground point where the first switch and the second switch are alternately turned on so that a voltage of a DC electric power is transformed and [outputted] output; and

a detection circuit that detects when the first switch and the second switch are simultaneously turned on,

wherein the detection circuit monitors a driving signal that drives the first switch and the second switch to detect a state that the first switch and the second switch are simultaneously turned on.

39. (TWICE AMENDED) An electronic equipment, comprising:

a switching regulator, comprising

a first switch;

an inductor which is connected in series with the first switch;

a second switch disposed between a connecting point of the first switch with the inductor and a ground point, in which the first switch and the second switch are alternately turned on so that a voltage of a DC electric power is transformed and [outputted] output; and

a detection circuit that detects a state that the first switch and the second switch are simultaneously turned on, wherein the electronic equipment is operative with an electronic power from the DC-DC converter,

wherein the detection circuit monitors a driving signal that drives the first switch and the second switch to detect the state that the first switch and the second switch are simultaneously turned on.

40. (TWICE AMENDED) A method of monitoring a switching regulator, comprising:

turning on a first switch and an inductor which are connected in series; [and]

turning on a second switch disposed between a connecting point of the first switch with the inductor and a ground point, wherein the first switch and the second switch are alternately turned on so that a voltage of a DC electric power is transformed and [outputted,] output; and

Serial No. 09/770,238

Docket No. 1080.1090

monitoring a driving signal that drives the first switch and the second switch to detect a  
state that the first switch and the second switch are simultaneously turned on [is detected].